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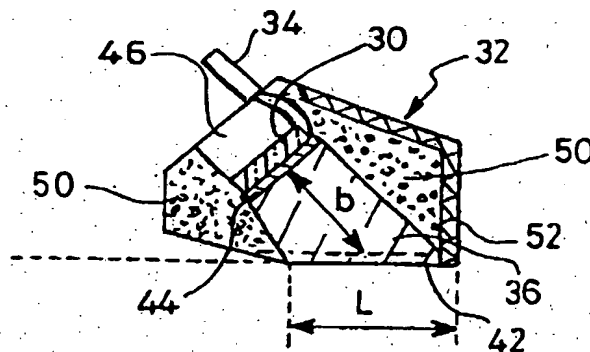
(58) Field of Search

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(54) Abstract Title

**Ultrasonic flowmeter**

(57) To measure flow rates of multi-phase flows in metal pipes, transceiver means (30) generates a pulsed narrow band ultrasonic signal in the range 100 KHz to 10 MHz and an impedance matching device (50) is coupled to the pipe to reduce or prevent reflections of the pulsed signal occurring from the pipe wall. Signal processing means analyses the reflected signals received by the transceiver means (30) and calculates the energy in the Doppler shifted part. The pulsed signal generates an ultrasonic shear wave in the pipe wall which assists in the analysis. The impedance matching device (50) comprises a sound absorbing block of plastics material with embedded tungsten particles. A probe that is shaped to fit the pipe wall contains the transceiver (50) which is coupled by an impedance matching layer (44) to a transmission path rod (36) within the block (50). An array of transceivers may be placed around and along the pipe.



*Fig. 2*

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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